

WELD 175B Course Outline as of Fall 2021**CATALOG INFORMATION**

Dept and Nbr: WELD 175B Title: WELDING TECHNOLOGY 2

Full Title: Welding Technology 2

Last Reviewed: 10/28/2013

| Units | | Course Hours per Week | | Nbr of Weeks | Course Hours Total | |
|---------|------|-----------------------|-------|--------------|--------------------|--------|
| Maximum | 6.00 | Lecture Scheduled | 3.00 | 17.5 | Lecture Scheduled | 52.50 |
| Minimum | 6.00 | Lab Scheduled | 9.00 | 17.5 | Lab Scheduled | 157.50 |
| | | Contact DHR | 0 | | Contact DHR | 0 |
| | | Contact Total | 12.00 | | Contact Total | 210.00 |
| | | Non-contact DHR | 0 | | Non-contact DHR | 0 |

Total Out of Class Hours: 105.00

Total Student Learning Hours: 315.00

Title 5 Category: AA Degree Applicable

Grading: Grade Only

Repeatability: 00 - Two Repeats if Grade was D, F, NC, or NP

Also Listed As:

Formerly: WELD 75B

Catalog Description:

Advanced welding processes and fabrication techniques for welding and related trades. Includes SMAW (Shielded Metal Arc welding), MIG (Metal Inert Gas), TIG (Tungsten Inert Gas), and Innershield Welding. Students gain skills required to pass the Unlimited American Welding Society Structural Certification Test.

Prerequisites/Corequisites:

Course Completion of WELD 175A

Recommended Preparation:**Limits on Enrollment:****Schedule of Classes Information:**

Description: Advanced welding processes and fabrication techniques for welding and related trades. Includes SMAW (Shielded Metal Arc welding), MIG (Metal Inert Gas), TIG (Tungsten Inert Gas), and innershield welding. Students gain skills required to pass the Unlimited American Welding Society Structural Certification Test. (Grade Only)

Prerequisites/Corequisites: Course Completion of WELD 175A

Recommended:
Limits on Enrollment:
Transfer Credit:
Repeatability: Two Repeats if Grade was D, F, NC, or NP

ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

| | | | |
|----------------------|----------------------|-------------------|------------------|
| AS Degree: | Area | Effective: | Inactive: |
| CSU GE: | Transfer Area | Effective: | Inactive: |
| IGETC: | Transfer Area | Effective: | Inactive: |
| CSU Transfer: | | Effective: | Inactive: |
| UC Transfer: | | Effective: | Inactive: |

CID:

Certificate/Major Applicable:

Certificate Applicable Course

COURSE CONTENT

Student Learning Outcomes:

At the conclusion of this course, the student should be able to:

1. Safely use the tools and equipment in a welding shop.
2. Demonstrate the skills needed to pass the American Welding Society Unlimited Structural Certification Test.

Objectives:

1. Safely use tools and operate equipment used in the welding trade for advanced fabrication techniques.
2. Demonstrate an advanced level of skill in the use of TIG (Tungsten Inert Gas), MIG (Metal Inert Gas), SMAW (Shielded Manual Arc Welding), cutting and gouging.
3. Fabricate advanced projects to the standard of industry.
4. Interpret blueprints for increasingly complex projects.
5. Demonstrate the skills required to pass an unlimited American Welding Society Structural Certification Test (SMAW, MIG, TIG, Innershield using unlimited metal thicknesses and flat, horizontal, vertical, and overhead positions).

Topics and Scope:

- I. Shielded Metal Arc Welding (SMAW)
 - A. Fillet welds, flat position
 - B. Fillet welds, vertical position
 - C. Single V-butt joints, flat, horizontal, and vertical positions
 - D. Welding cast iron
 - E. Hardfacing
 - F. Welding electrodes in all positions
- II. Oxy-Acetylene
 - A. Butt and lap joints, horizontal position

- B. Butt and lap joints, vertical position
- C. Brazing cast iron
- D. Case hardening
- E. Automatic flame cutting
- F. Preheating and post-heating
- III. Gas Metal Arc (also referred to as MIG)
 - A. Welding ferrous and non-ferrous metals
 - B. Power sources
 - C. Shielding gases
 - D. Wire feeders
 - E. Guns
 - F. Consumable wire
- IV. Gas Tungsten Arc Welding (also referred to as TIG)
 - A. Power sources
 - B. Horizontal and vertical
 - C. Overhead
 - D. Tungsten preparation
 - E. Metal preparation
 - F. Filler rod
- V. Air Arc Cutting
 - A. Equipment
 - B. Carbon electrode selection
 - C. Machine settings
- VI. Advanced Flame Cutting
 - A. Automatic
 - B. Machine settings
- VII. Metal Surfacing
 - A. Wear problems
 - B. Material selection
 - C. Process selections
 - D. Metal spraying
 - E. Case hardening
- VIII. Plasma Arc Cutting
 - A. Power source
 - B. Torch and nozzle selection
 - C. Cutting gases
 - D. Ferrous and nonferrous metals
 - E. Advanced cutting techniques
- IX. A.W.S. Certification Test
 - A. Prepare plates
 - B. Weld (SMAW or MIG)
 - C. Prepare test samples
 - D. Bend coupons
- X. Fabrication Techniques
 - A. Tacking
 - B. Weld direction
 - C. Shrinkage
 - D. Distortion prevention and control
- XI. Blueprint Reading
 - A. Print interpretation
 - B. Create a project blueprint

Assignment:

1. Reading: approximately 10-20 pages per week.
2. Complete chapter reviews and homework problems.
3. Notebook including lecture/demonstration notes and handouts.
4. Skill demonstrations: weekly welding samples and fabrication techniques using SMAW, MIG, TIG, and Innershield Welding processes, unlimited metal thicknesses, in all positions.
5. Welding projects (5-10). Using a given number of pieces of metal and a given process, fabricate project in a specified amount of time.
6. Quizzes (5-10).
7. Final fabrication project: demonstration of skill and proficiency in all processes. Students may complete a project of their own choosing that will demonstrate proficiency in all processes.

Methods of Evaluation/Basis of Grade:

Writing: Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

Chapter reviews and notebook

Writing
10 - 20%

Problem Solving: Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Homework problems

Problem solving
5 - 10%

Skill Demonstrations: All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

Performance exams, Samples; projects; final fabrication project

Skill Demonstrations
50 - 60%

Exams: All forms of formal testing, other than skill performance exams.

5-10 quizzes

Exams
10 - 20%

Other: Includes any assessment tools that do not logically fit into the above categories.

Participation

Other Category
0 - 15%

Representative Textbooks and Materials:

Modern Welding Technology. Howard B. Cary. Prentice Hall, 2004. (Seminal book in field)
Instructor prepared materials.